What is claimed is:

1. In a medical device system having a plurality of monitoring elements, a method for detecting poor signal quality and for phase shifting neurological signals received from the plurality of monitoring elements, comprising the steps of:

(a) receiving a first neurological signal from a first monitoring element and a second neurological signal from a second monitoring element;

(b) processing the first neurological signal to generate a plurality of data points for the first neurological signal in a moving time window;

(c) detecting whether the first neurological signal has poor signal quality by determining that an amount of the data points exhibiting poor signal quality within the moving time window has exceeded a predetermined threshold;

(d) if the first neurological signal has poor signal quality, ignoring the first neurological signal experiencing poor signal quality in signal processing; and

(e) if the first neurological signal does not have poor signal quality, performing (i) sampling the first and second neurological signals at different time instances resulting in a time shift between the first and second neurological signal samples; and (ii) time shifting signal samples of the second neurological signal to correct for the time shift so the second neurological signal is synchronized with the first neurological signal.

2. The method of claim 1, further comprising the step of (f) delivering a notification that the signal from one of the monitoring elements is experiencing poor signal quality.

3. The method of claim 1, further comprising the step of (f) providing a substituted signal for the ignored signal experiencing poor signal quality.

4. The method of claim 1, wherein the step of detecting comprises the step of determining that percentage of the data points exhibiting poor signal quality within the moving time window has exceeded a predetermined threshold percentage.

5. The method of claim 1, wherein the step of ignoring comprises the step of ignoring the received signal experiencing poor signal quality in a closed-loop feedback control of a treatment therapy.

6. The method of claim 1, wherein the step of receiving comprises the step of receiving the first neurological signal selected from the group consisting of an electrical signal, a chemical signal, a biological signal, a temperature signal, a pressure signal, a respiration signal, a heart rate signal, a ph-level signal, and a peripheral nerve signal.

7. The method of claim 1, wherein the step of receiving comprises the step of receiving the first neurological signal from the first monitoring element selected from the group consisting of an electrode and a sensor.

8. The method of claim 1, wherein the step of processing comprises the step of identifying a value of at least one variable quantifying signal quality.

9. The method of claim 8, wherein the step of identifying a value comprises the step of determining a flat-line fraction signal to determine whether a signal is experiencing a flat-lining artifact.

10. The method of claim 8, wherein the step of identifying a value comprises the step of determining a flat-line fraction signal to determine whether a signal is experiencing amplifier saturation clipping.

11. The method of claim 8, wherein the step of identifying a data value comprises the step of determining an amplitude at a predetermined frequency to determine whether a signal is experiencing a mains artifact.

12. The method of claim 11, wherein the step of determining an amplitude comprises the step of determine an amplitude at about 60 Hz.

13. The method of claim 11, wherein the step of determining an amplitude comprises the step of determine an amplitude at about 50 Hz.

14. The method of claim 1, wherein the step of detecting comprises the step of performing a time-averaging of the data points.

15. The method of claim 1, wherein the step of detecting comprises the step of performing a time-averaging of the data points using exponential forgetting.

16. The method of claim 1, wherein the step of receiving further comprises the step of receiving the first neurological signal for purposes of providing closed-loop feedback control of a treatment therapy.

17. The method of claim 11, further comprising the step of (e) resuming consideration of the poor signal in the closed-loop feedback control once it is determined that the amount of the data points exhibiting poor signal quality within the time window has fallen below a second threshold.

18. The method of claim 8, wherein the step of identifying a value comprises the step of determining a clip fraction signal to determine whether a signal is experiencing a clipping artifact.